

WHAT IS CLAIMED IS:

5

1. An image evaluation method for evaluating a dot in an image produced by an imaging apparatus that generates a two-dimensional image on a support medium, said image being formed by a plurality of dots having a predetermined dimension arranged in a main scanning direction and a sub scanning direction at predetermined pitches of at least 2.5 times the predetermined dimension of the dots, the method comprising the step of:

evaluating a dot position deviation in the sub scanning direction by measuring a dot position of each dot in the image.

20 2. The image evaluation method as claimed in claim 1, further including evaluating a dot size variation in the image by measuring a dot size of each dot in the image.

25

3. The image evaluation method as claimed in claim 1,
wherein the image produced by the imaging apparatus is formed
by a plurality of dots in a diagonal line such that adjacent
5 dots of the diagonal line are offset from each other by at
least one dot in the sub scanning direction.

10

4. An image evaluation apparatus, comprising:

an image input unit that captures an image reproduced by
an imaging apparatus as a two-dimensional image signal at a
resolution that is at least twice as high as a dot resolution
15 of the image, said image signal representing an image formed by
a plurality of dots having a predetermined dimension arranged
in a main scanning direction and a sub scanning direction at
predetermined pitches of at least 2.5 times the predetermined
dimension of the dots;

20 an image storage unit that stores the image signal
acquired by the image input apparatus; and

an image signal computation unit that obtains the image
signal from the image storage unit and performs a computation
for evaluating the image based on the image signal.

25

5. An image evaluation program implemented in an image
5 evaluation apparatus to evaluate a dot of an image that is
reproduced on a support medium by means of an imaging apparatus
and formed by a plurality of dots having a predetermined
dimension arranged in a main scanning direction and a sub
scanning direction, said image evaluation apparatus producing
10 image signals at a resolution at least twice as high as a dot
resolution of the image, and said image evaluation program
being arranged to measure a dot position of each dot in the
image, the image evaluation program comprising instructions to
execute the steps of:

15 obtaining image signals of a portion of the image
reproduced by the imaging apparatus, said portion of the image
containing a dot line of at least three dots arranged in the
main scanning direction at a predetermined pitch of at least
2.5 times the predetermined dimension of the dots;

20 setting a dot detection start position within the portion
of the image, detecting an image signal value of said dot
detection start position, and accumulating the detected image
signal value of the dot detection start position;

successively determining a next dot detection position
25 within the portion of the image based on the dot detection

start position and the predetermined pitch in the main scanning direction, detecting the image signal value of the next dot detection position, and accumulating the detected image signal value of the next dot detection position;

5 calculating an accumulation value of the detected image signal values of the dot detection start position and the next dot detection position;

 successively shifting the dot detection start position within the portion of the image and repeating the steps of
10 detecting and accumulating the image signal value of the dot detection start position, determining the next dot detection position, detecting and accumulating the image signal value of the next dot detection position, and calculating the accumulation value to obtain a plurality of accumulation
15 values;

 comparing the plurality of accumulation values and detecting a minimum accumulation value; and

 determining the dot positions of the dot line contained in the portion of the image based on the dot detection positions
20 of which the accumulation value corresponds to the minimum accumulation value.

6. The image evaluation program as claimed in claim 5,
further comprising an instruction for:

repeating the steps of obtaining image signals of a next
portion of the image that is adjacent to the portion that has
5 just been measured with respect to the sub scanning direction,
and determining the dot positions of the dot line contained in
the portion of the image to obtain the dot position of each dot
in the image.

10

7. The image evaluation program as claimed in claim 5,
wherein:

15 the predetermined pitch in the main scanning direction,
used in the dot position detection of the dot line, is varied
within a predetermined range, and the dot positions of the dot
line contained in the portion of the image are determined based
on the dot detection positions of which the accumulation value
20 corresponds to the minimum accumulation value from among the
accumulation values obtained using the various pitches.

25

8. The image evaluation program as claimed in claim 7,
wherein:

the dot pitch that has been used to determine the dot
detection positions of which the accumulation value corresponds
5 to the minimum accumulation value is used in a subsequent dot
position detection of the dot line in the portion of the image
next in line with respect to the sub scanning direction.

10

9. The image evaluation program as claimed in claim 5,
wherein:

a slope of a dot detection base line extending in the main
15 scanning direction on which the dot detection positions are
aligned at the predetermined pitch in the main scanning
direction, used in the dot position detection of the dot line,
is varied within a predetermined range while the predetermined
pitch in the main scanning direction is maintained at the same
20 pitch, and the dot positions of the dot line are determined
based on the dot detection positions of which the accumulation
value corresponds to the minimum accumulation value from among
the accumulation values obtained using the dot detection base
lines with the various slopes.

25

10. The image evaluation program as claimed in claim 5,
5 further comprising instructions to execute the steps of:

obtaining image signals of a region of the image
adequately containing a dot being measured in the image based
on the detected dot position of said dot;

calculating an average value of the image signals
10 corresponding to surrounding areas of the dot being measured
that is within the region of the image; and

determining a dot size of the dot being measured by
successively calculating and accumulating a difference between
an image signal value within the region of the image and the
15 average value of the surrounding areas of the dot being
measured for each of the image signal values contained in the
region of the image.

20

11. The image evaluation program as claimed in claim 5,
further comprising the steps of:

obtaining image signals of the support medium in a state
25 prior to having the dots of the image reproduced by the imaging

apparatus and storing the image signals of the support medium;

obtaining image signals of the image with the dots reproduced on the support medium by the imaging apparatus;

calculating a difference between the image signals of the reproduced image and the image signals of the support medium to
5 obtain a processed image; and

determining a dot size of a dot being measured in the image by accumulating image signals of a region of the processed image adequately containing the dot being measured,
10 said region of the processed image being obtained based on the detected dot position of the dot being measured.

15

12. A recording medium, comprising:

a memory unit that is arranged to store an image evaluation program implemented in an image evaluation apparatus to evaluate a dot of an image that is reproduced on a support
20 medium by means of an imaging apparatus and formed by a plurality of dots having a predetermined dimension arranged in a main scanning direction and a sub scanning direction, said image evaluation apparatus producing image signals at a resolution that is at least twice as high as a dot resolution
25 of the image, and said image evaluation program being arranged

to measure a dot position of each dot in the image, the recording medium comprising instructions to execute the steps of:

obtaining image signals of a portion of the image produced
5 by the imaging apparatus, said portion of the image containing a dot line of at least three dots arranged in the main scanning direction at a predetermined pitch of at least 2.5 times the predetermined dimension of the dots;

setting a dot detection start position within the portion
10 of the image, detecting an image signal value of said dot detection start position, accumulating the detected image signal value of the dot detection start position;

successively determining a next dot detection position within the portion of the image based on the dot detection
15 start position and the predetermined pitch in the main scanning direction, detecting the image signal value of the next dot detection position, and accumulating the detected image signal value of the next dot detection position;

calculating an accumulation value of the detected image
20 signal values of the dot detection start position and the next dot detection position;

successively shifting the dot detection start position within the portion of the image and repeating the steps of detecting and accumulating the image signal value of the dot
25 detection start position, determining the next dot detection

position, detecting and accumulating the image signal value of the next dot detection position, and calculating the accumulation value to obtain a plurality of accumulation values;

5 comparing the plurality of accumulation values and detecting a minimum accumulation value; and

 determining the dot positions of the dot line contained in the portion of the image based on the dot detection positions of which the accumulation value corresponds to the minimum
10 accumulation value.